



VARIATION OF PROXIMATE COMPOSITION IN GREEN GRAM (*VIGNA RADIATA* (L.) R. WILCZEK) SEEDLINGS AS EFFECTED BY TREATMENT WITH BACTERIAL COMPOST PREPARED FROM SUGARCANE LEAF WASTE

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ABSTRACT

Bacterial compost was prepared from the decomposed sugarcane leaf waste using bacteria isolated from cashew nut and groundnut processing areas. This compost was used to study its effect in bringing about variation in proximate composition of the seedlings of *Vigna radiata* (L.) R. Wilczek in comparison with vermicompost, Natural compost and Inorganic fertilizer. The different setups were irrigated with equal quantities of the respective compost solutions on alternate days. After 7 days the germinated seedlings were subjected to proximate analysis of Carbohydrates, Proteins, Lipids and Chlorophyll, to study the effect of different compost and Inorganic fertilizer. The treated seedlings showed a high value of proximate composition for Bacterial compost and Natural compost, when compared to other treatments. This shows that these components have a role to play in the growth enhancement of seedlings in these treatments.

KEYWORDS: Lipids, Carbohydrates, Proteins, Chlorophyll, Shell waste. Groundnut, cashewnut.

INTRODUCTION:

Fertilisers enhance the growth of the plants due to the presence of nutrients. Over use of these fertilizers has made the soil less fertile in the recent times due to the unnecessary addition of salts that form a part of chemical fertilizers. In course of time this has led to the formation of fallow lands that are beyond reclamation. Hence in the modern world it has become necessary to find a biological substitute for the nutrition of plants. This was assured in the concept of bio-fertilizer which is complete biological solution for the current scenario. A number of bio fertilizers have been in use such as (FYM) Farm yard manure Vermicompost, Panchakavya and so on.

In the present study a special type of compost has been generated from the decomposition of Sugarcane leaf waste using Bacteria isolated from Cashew nut shell and Groundnut shell processing areas. This compost was used to study the effect of seed germination and seedling growth in comparison with other composts such as vermicompost, Natural compost and Inorganic fertilizer in order to establish the efficiency of Bacterial compost as a potent growth enhancer. The present investigation attempts to showcase the efficiency of bacterial compost as a bio fertilizer of rich nutrient quality and quantity. Seed germination and seedling growth using vermiwash has been earlier reported in *Vigna radiata* by Mujeera Fathima and Malathy Sekar (2014)

It is well known that composts are rich in plant hormones like IAA and GA (Kate et al 1992) and Vadmalalai Krishnan and Mujeera Fathima (2013). It has been reported that use of Bacterial Compost brought about enhanced growth when compared with other compost and Inorganic fertilizer (Asif et al 2017). Hence the present study aims to determine the amount of biological components such as the Carbohydrates, Protein, Lipids and Chlorophyll in *Vigna radiata* seedlings raised in bacterial compost solution as compared with other compost solutions and inorganic fertilizer.

MATERIALS AND METHODS:

Vigna radiata (L.) R. Wilczek is the common green gram and also known as "Mung" belongs to the family Fabaceae. The seed were procured from National Seeds Corporation, Ambattur Chennai, India. The compost solution for the experiment was prepared by dissolving 10 grams of compost in 100 ml distilled water to make a 10% solution for Natural compost, vermicompost, Bacterial compost and in the case of inorganic fertilizer 10 grams of complex fertilizer dissolved in 100ml of distilled water was used. The control setup was treated with distilled water alone. (Table: 1)

Table 1
Showing the composition of the different treatments.

Sr. No	Treatment	Concentration of the Compost
1	Control	Distilled Water
2	Vermicompost	10% of Vermicompost
3	Natural Compost	10% of Natural Compost
4	Bacterial Compost	10% of Bacterial Compost
5	Inorganic Compost	10% of Complex

Three petriplates were used for each setup and 20 seeds were taken in each petriplate. The petriplates were lined with cotton and Whatman No: 1 filter Paper. They were moistened with water and irrigated with the respective test solutions at the rate of 3 ml per petriplate. The data was recorded in 7 day- old seedlings.

PROXIMATE ANALYSIS:

The Proximate Analysis was undertaken in the seedlings of different setups to estimate the nutrients by following the standard methods. Estimation of Carbohydrates was carried out by Anthrone Method (1952). Estimation of Protein was carried out by Lowry's Method (1951), and Lipids were estimated by Folch method (1957). Estimation of Chlorophyll was done by following the method of Arnon, (1949).

RESULTS AND DISSECTION:

The Proximate Analysis of different components such as Carbohydrates, Protein, Lipids and Chlorophyll was done for all the treatments such as Bacterial compost, Natural compost and Inorganic fertilizer.

The amount of Carbohydrates in 1 mg of the Bacterial compost treated sample was 92.70 µg, Protein content was 63.71 µg, and the Lipid content was 28.5 mg. The total Chlorophyll in the Bacterial compost treated sample was 0.369107 µg/ml.

The Proximate Analysis value for other composts such as the Vermicompost, Natural compost, and Inorganic fertilizer were also determined and recorded in Table 2.

Table 2
Showing the proximate analysis of the treated seedlings.

Sr. No	Treatment	Carbohydrates µg/mg	Proteins µg/mg	lipids µg/mg	Total chlorophyll µg/mg
1	Control	120.55	89.14	37.2	0.345304
2	Vermicompost	92.70	63.71	28.5	0.369107
3	Natural compost	121.85	149.77	63.8	0.227925
4	Bacterial compost	167.08	128.11	55.7	0.356532
5	Inorganic fertilizer	79.15	-	-	-

The results indicated that Chlorophyll content was high in Bacterial compost and Vermicompost and minimum in Natural compost treatment. The inorganic fertilizer treated plants were in decomposed state and so it was not possible to estimate all the components. Carbohydrate content was maximum in Bacterial compost followed by Natural compost and the control. As for the Protein and lipids was concerned Natural compost had high levels followed by Bacterial compost and control.

These results prove that Bacterial compost and Natural compost have been effective in enhancing plant growth but low amount of lipids in vermicompost

shows that this treatment brings about a better utilization of lipids in the seedlings.

A similar study by Asif *et al* (2017) revealed that Bacterial compost brought maximum growth enhancement followed only by Vermicompost and Natural compost. The present study is in accordance with this report.

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